Describing the scale and composition of calls for service in Detroit

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Abstract

In the spirit of a recent contribution by Ratcliffe (2021) published in *Crime Science* this short paper describes the scale and composition of public demand for police services in Detroit, United States, during 2019. Findings broadly confirm those by Ratcliffe, namely, that a considerable proportion of police time is spent resolving a diverse array of calls for service, including public health incidents. The temporal and spatial patterning of different types of public demand for police services are often distinct. The data and code to replicate analyses are made openly available.

Keywords: police, calls for service, 911, demand, reactive.

Introduction

Amidst austerity measures, growing public expectation, and scrutiny, understanding the public demand for police services has become a priority among evidence-based policing researchers and practitioners (Boulton et al., 2017). Without a grasp on the scale ('how much?') and composition ('what type?') of police demand, we are likely to observe sub-optimal and inequitable outcomes for the public, the inappropriate distribution of public funds, and unnecessary strain on officers (Ellison et al., 2021; Lum et al., 2021). Understanding the characteristics public demand for the police has become particularly pertinent following recent calls to rethink, and some cases, radically reform, the role and reach of contemporary police forces (Lum et al., 2021).

A study from Ratcliffe (2021) in *Crime Science* sought to describe the complexity and diversity of public demand for police services in Philadelphia, United States. The study was motivated by the recognition that police spend a considerable proportion of deployed resource resolving incidents which fall outside the traditional crime-fighting role of the police. Instead, the origins of public demand for the police can often be attributed to a lack of supply and/or accessibility failure in other organisations, such as those providing support for people requiring (mental) health assistance (Dijk & Crofts, 2017; Wood et al., 2021). The study's findings provided data-driven evidence to suggest that the police indeed spend considerable amounts of time dealing with incidents that could be resolved by other – often more appropriate – agencies. Comparable findings were subsequently reported in the United States across multiple (anonymised) police jurisdictions (Lum et al., 2021). In advance of recent contributions, this short paper uses comparable descriptive statistics to describe the public demand for police services in Detroit, United States, using open data and open code which can be used to reproduce the findings (see xxxxxxxxxxxxxxxxxxxxxxxxxxxxx).

Measuring demand

Using computer aided dispatch (CAD) data from the Philadelphia Police Department (PPD) the Ratcliffe (2021) study provided a breakdown of calls for police service during 2019. CAD codes, used to describe calls, of which eighty unique descriptions originated from the public and required officer dispatch, were classified into six broad categories: community issues, crime, medical/public health, proactive policing, quality of life, and traffic duties. Recognising that frequency counts of calls for service do not necessarily reflect the amount of consumed police resource, raw counts were adjusted by the time committed by officers to deal with each incident type. Findings indicated that around 55% of officer shift activity time was spent on calls relating to crime, with the remainder of time allocated to incidents involving medical/public health (9%), the community (7%), proactive policing (5%), quality of life (14%) and traffic duties (11%). Focusing on medical/public health incidents, findings also indicated that calls concentrated in particular areas of the city and during particular hours of the day.

The data used for this study covers the city of Detroit in Michigan, United States. The City of Detroit authority publish calls for service data through their open data portal.[1]. The raw data includes both citizen-initiated 911 calls to request police services and officer-initiated calls spanning back to September 2016. In alignment with Ratcliffe (2021), the data used here is subset for the year 2019 and excludes those calls initiated by an officer. For each incident, the response time and time on the scene are reported. In sum, these comprise the total time officers spend on the incident. Incidents which had a total allocated time of zero minutes (or negative values) were excluded.

Each incident has a *calldescription* variable which describes the nature of the call. Call descriptions involving administrative duties (e.g., "start of shift information"), completely unknown problems, and non-deployment (e.g., "employee call in / time off") were removed. This left 207 unique call description categories. In the interests of parsimony and ease of interpretation these categories were recoded into 101 broader call descriptions.[2] Each call description was then categorised into the six demand type classifications used in Ratcliffe (2021). 2.8% of incidents were deemed unclassifiable. For each of the six demand types, an 'other' classification was generated for those incident types which consumed less than 0.2% of police time during the year. This left a total of 48 categories for the reported breakdowns, capturing 267 thousand individual public calls for service during 2019.

In the spirit of Ratcliffe (2021), the frequency counts and proportional breakdowns for each demand type classifications are reported in Table 1. This tells a comparable story to Philadelphia: a considerable proportion of citizen calls for service, and in turn, time spent by officers, is committed to a diverse array of issues. In Detroit, just 46% of police time was spent dealing with calls for service relating to crime (55% in Philadelphia). The remainder of time was spent dealing with community issues (6%), public and mental health (7%), proactive activity (7%), quality of life incidents (19%) and traffic duties (13%).

The proportional breakdown of time consumed for each incident, grouped by demand type classification, are visualised in Figure 1. Here, it is clear that a small number incident types tend to dominate each demand classification. While incident descriptions are not always comparable, this visualisation confirms the diversity and complexity of public demand for police services reported in Ratcliffe (2021).

Table 1: Breakdown of frequency counts and time committed for each demand type.

Demand type	Count	Count (%)	Time (%)
community	14946	5.58	6.36
crime	116571	43.54	45.72
health	20269	7.57	7.18
proactive	18637	6.96	6.89
quality of life	56541	21.12	18.89
traffic	33153	12.38	13.11
unclassified	7620	2.85	1.86

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[1]Accessible via https://data.detroitmi.gov/

[2]We refer readers to the corresponding GitHub repository for further details on how call descriptions were combined (xxxxxxxxxxxxxxxxxxxxxxxxxxx). Readers unfamiliar with R code can review the reference table entitled 'categorisation summary.'

Figure 1: Proportional breakdown of deployed time spent on each incident category. Graphic inspired by Ratcliffe (2012).
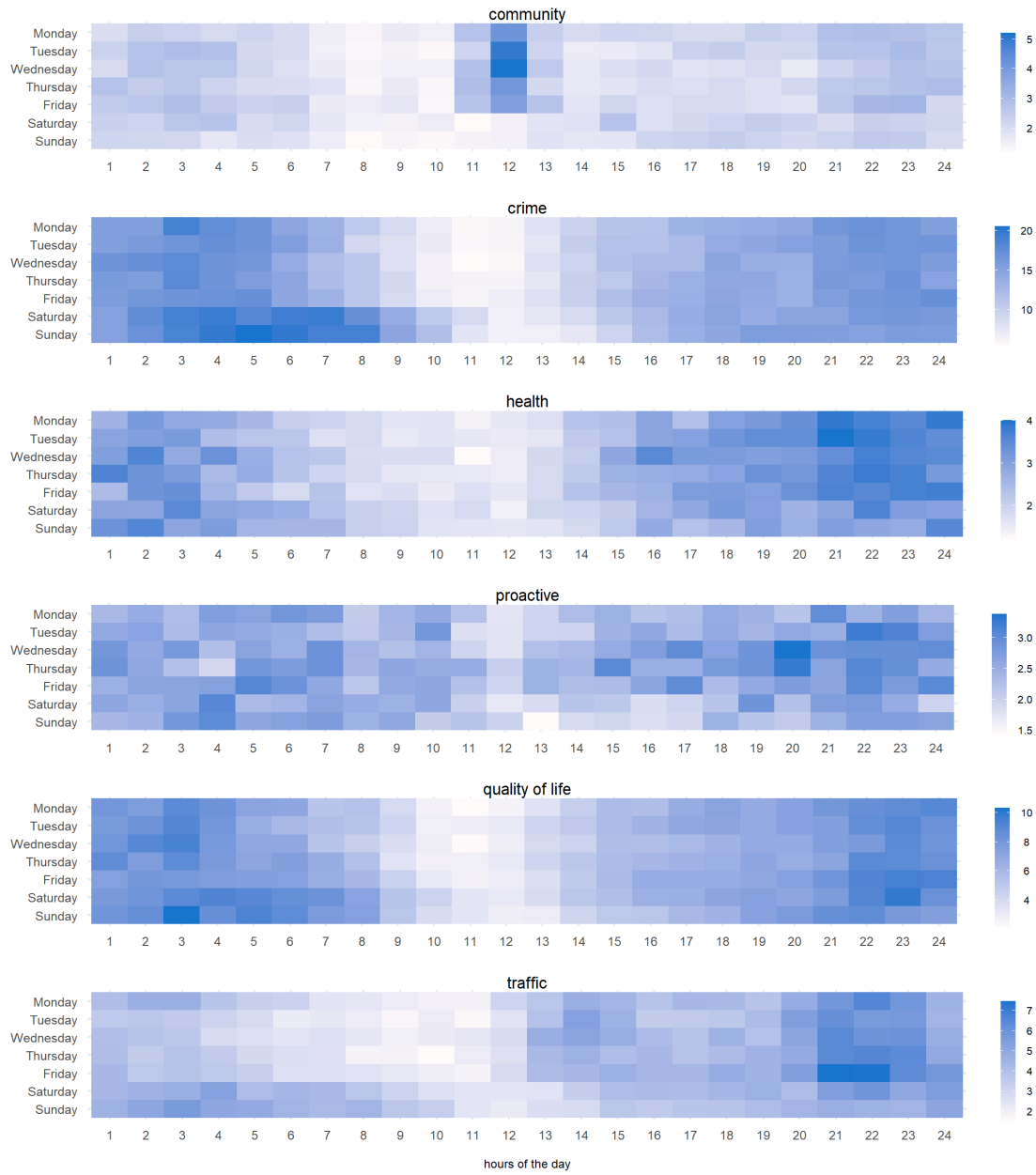
Temporal patterning

Figure 2: Mean incident counts by day and week, for each demand type.

Spatial patterning

Each incident also has corresponding latitude and longitude coordinates to describe the incident location. 2% of incidents were excluded from the spatial descriptive analyses due to incomplete or unknown geographic information. Individual points were aggregated to 1000ft^2 grid cells laid over the city to generate basic descriptive heatmaps of counts during the year. These are visualised foe each demand classification in Figure 3.

Figure 3: Spatial patterning of total incident counts for each demand type.

Discussion

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